AGU FALL MEETING
San Francisco | 14–18 December 2015

P42A-07: Comparison of the Cratering Records of Ceres and Rhea

ABSTRACT

Thursday, 17 December 2015
11:50 - 12:05
Moscone West - 2007

Comparing the cratering records of dwarf planet Ceres and the Saturnian satellite Rhea, offers a great opportunity in comparative planetology to fill the gaps of understanding of the cratering history of the two bodies. Both bodies show strong indications for a water-ice rich crust. For Ceres, the amount of ice in the crust is indeterminate. Early Dawn imaging data shows complex craters on Ceres which are smaller than those on the basaltic asteroid Vesta. The smallest complex craters on Ceres are similar in size (~10-15 km) to those on Rhea, which might indicate a rather high water-ice content in Ceres' crust. The surface gravity on both bodies is almost equal, differing by only ~4%. Thus, regardless of their absolute values many variables required to relate projectile and crater size should be very similar on both bodies (surface gravity, strength to gravity transition, simple to complex transition, target density). The remaining variables such as projectile density and impact velocity are comparatively well known for Ceres but still in discussion for the Saturnian satellites. If the crater size-frequency distributions for craters >5 km from Rhea and Ceres are plotted together and are corrected for different projectile flux and exposure time, both records plot nearly on top of each other. This could indicate a common projectile population that impacted both bodies at nearly the same velocity. However, if the impacting projectile populations are very different, the impact velocity would have to compensate for such differences. Different ice temperatures may also play some role. Reducing the degrees of freedom increases the chance of understanding the projectile source and dynamics in the Saturnian system. We acknowledge the support of the Dawn and Cassini Instrument, Operations, and Science Teams. This work is supported by the German Space Agency (DLR), grants 50OW1101, 50OH1102 and 50OH0305.

NAVIGATION

Home

Section/Focus Group

Events

Co-Sponsored

Cross-Listed

SWIRL Themes

AGU On-Demand

EPoster

Index Terms

Meeting Resources

Meeting Website

Technical Support

Click to add an item to 'My Schedule'.

Click ☆ to add/remove an item to 'My Favorites'.

Click to add/remove a person to 'My Contacts'.

Click to access your Schedule

Due to a known issue with Firefox, it is recommended that any printing be done in an alternate browser.

Nico Schmedemann
Free University of Berlin

Roland Wagner
DLR - German Aerospace Center

Gregory Michael
Free University of Berlin

Thomas Kneissl
Free University of Berlin

Harald Hiesinger
University of Münster

Boris Ivanov
Russian Academy of Sciences

Tilmann Denk
Free University of Berlin

Ralf Jaumann
DLR - German Aerospace Center

Free University of Berlin

Adrian Neesemann
Free University of Berlin

Carol Raymond
Jet Propulsion Laboratory

Christopher Russell
University of California Los Angeles

View Related Events

Session: Vesta and Ceres as Seen by Dawn and Earth-Based Instruments I

Section/Focus Group: Planetary Sciences

Day: Thursday, 17 December 2015

Click to add an item to 'My Schedule'.

Click ☆ to add/remove an item to 'My Favorites'.

Click to add/remove a person to 'My Contacts'.

Click to access your Schedule

Due to a known issue with Firefox, it is recommended that any printing be done in an alternate browser.

+